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Eastman Chemical Company
Comments on DOE Proposed Rules Concerning
Loan Guarantees for Projects that Employ Innovative Technologies
10 CFR Part 609
RIN 1901-AB21

Introduction to Eastman

Eastman Chemical Company manufactures and markets chemicals, fibers and plastics worldwide. It provides key differentiated coatings, and adhesives and specialty products; is the world's largest producer of PET polymers for packaging; and is a major supplier of cellulose acetate fibers. Founded in 1920 and headquartered in Kingsport, Tennessee, Eastman is a FORTUNE 500 company with 2006 sales of $7.5 billion and approximately 11,000 employees. Approximately 7,000 of those are employed in Tennessee and another 2,600 are located elsewhere in the United States. For more information about Eastman, and its products, visit www.eastman.com.

Eastman and Gasification

Eastman was a pioneer in commercializing the first U.S. chemicals from coal facility in 1983. Eastman received Chemical Engineering magazine's Kirkpatrick Award for Engineering Excellence for recognition of its "chemicals from coal" facility in Kingsport, Tennessee, and the facility has been designated an American Chemical Society National Historic Chemical Landmark.

Eastman's coal gasification operating performance is industry-leading and is highly regarded world wide. The first full year of operation (1984), Eastman's forced outage rate was between 8% and 9% and has averaged less than 2% ever since. Forced outage rate for the past full three year maintenance cycle was 1.06%, and the gasification facility was on-stream over 98% of the time.

Eastman has a strong commitment to process improvement and has continually improved and optimized its gasification operations over time. Today, Eastman operates its coal gasifiers at the highest syngas output per unit gasifier volume of any GE Energy designed solids-fed gasifier in the world. In addition, Eastman has built a tremendous support infrastructure for gasification during the past two decades. Some examples of that support infrastructure include:

- A large data base of equipment reliability data and root cause failure analyses
- Gasification modeling and simulation
- Advanced process control systems
- Process instrumentation and analysis (including on-line analyses)
- Refractory design, inspection, and installation services
- Reliability-based predictive maintenance systems
- Coal, petcoke, and slag chemistry and characterization
- Optimized standard operating procedures
- Rapid gasifier start-up and switch-over procedures
- Multiple gasifier operation and integration experience
- Specialized materials science and metallurgy
- A large code-rated machine shop for critical parts fabrication and repair
- Proven environmental and safety systems and procedures

Eastman's technical, operations, and support staff have over 600 years of combined experience in coal gasification, an experience base which is unrivaled in the chemical industry. In addition to experience with Eastman's gasifiers, Eastman has made selective hires of gasification experts with broad experience at other companies and facilities. Eastman engineers have had direct

experience with start-up, trouble-shooting, and/or operations at over 20 gasification facilities around the world, including a number of petcoke and coal-fed gasifiers.

In addition to gasification expertise, Eastman and its subsidiaries have over 80 years of experience in managing large integrated manufacturing sites. Eastman owns and operates a number of large integrated plant sites in the U.S. and overseas. Eastman's largest site in Kingsport, Tennessee, has over 7,000 employees and manufactures hundreds of products.

Eastman has also developed an extensive and respected expertise in the management, execution, and commissioning of major capital projects. In external benchmarking studies, Eastman was recognized for top quintile performance in overall capital cost, schedule performance, and overall capital effectiveness, as well as being ranked best-in-class in several areas.

Industrial gasification opportunities represent the logical economic and technological path forward to achieve four policy objectives that are key to America's economic and environmental health. Those are:

1. cost-effective environmental protection;
2. energy security through reliance on domestic fuel resources;
3. reduction of natural gas prices and price volatility to all consumers; and
4. global competitiveness and millions of high technology jobs in America's industrial sector.

Gasification Technology Challenges

Title XVII (Section 1703) of the Energy Policy Act of 2005 (Title XVII) (42 USC 16511-16514) specifically recognizes the eligibility of industrial gasification and carbon capture and sequestration practices and technologies for federal loan guarantees.

As promising as industrial gasification is for the policy objectives noted above and even with Eastman's considerable experience, deployment of commercial gasification plants will not occur and the "proving ground" for carbon capture and sequestration will not be available unless federal and state governments provide the necessary incentives and framework to attract "first adopter" projects.

Contrary to arguments made in the MIT study *The Future of Coal*, gasification technology is not "commercial" today. We at Eastman are the country's most experienced and successful practitioners of industrial gasification. But our experience of more than 20 years at Kingsport is, by itself, inadequate to persuade architect and engineering firms and financiers to reduce the risk premiums they are currently charging for first-of-a-kind gasification projects in the US. This premium is currently about twenty percent higher than the cost of such plants is expected to be after the first dozen or so are successfully deployed and operated in commercial service.

Furthermore, given these higher costs and the risk of being "first adopters," this is causing U.S. chemical companies to build conventional facilities in overseas locations where natural gas prices are relatively low. These are many of the same locations that compromise our Nation's energy security and exacerbate our trade balance problems. Eastman strongly believes that the high-paying chemical industry jobs in America can be preserved by deploying technology to gasify plentiful domestic resources of coal, petcoke, biomass and industrial waste materials.

Incentives, such as Section 48A and 48B tax credits, as well as Title XVII, are necessary to encourage commercialization of gasification projects. The use of gasification will cause the

substitution of other materials for natural gas, thus resulting in decreases in demand (and presumably prices) for natural gas. The benefits to all Americans from lower and stable natural gas prices will pay for the expense of the Section 48A & B tax credit programs and any expenses associated with Title XVII loan guarantees in short order. The other benefits previously noted make these tax programs, and Title XVII implementation even more compelling. However, none of these benefits accrue directly to the first adopters of gasification technology. In fact, first adopters of industrial gasification technology, operating in a globally competitive market, would be taking on more cost and risk than their competitors absent the Section 48B and Federal Loan Guarantee (Title XVII) incentives. Financiers will be more likely to lend money to such ventures if there are external incentives to "buy down" the risk and cost for a novel project.

Federal incentives necessary to stimulate experience in carbon capture and long-term geologic sequestration and the subsequent development of protocols will be expensive. Twelve projects, based on different technologies and geologic circumstances will likely cost up to $10 billion just for the carbon capture, transportation and storage aspects of the projects. Incentives for gasification technology deployment would be a few billion additional dollars. However, the cost of imposing greenhouse gas reduction regulations in the future without a program of technology development and commercial scale deployment would certainly lead to inefficient choices, much greater expense to the country and serious loss of productivity for our economy.

Specific Recommendations

In the discussion of "new or significantly improved" technologies eligible for federal loan guarantees and the exclusion of "commercial" technologies, DOE offers alternative definitions for comment. Concerning "commercial technologies to be excluded," we would recommend the DOE's alternative definition which would allow up to five commercial-scale projects of a particular technology (e.g., industrial gasification for chemicals) before calling the technology "commercial" and excluding it from federal loan guarantee eligibility. The DOE alternative definition of "commercial lifetime of over five years" could be interpreted to disqualify another project similar to our Kingsport facility. If a five year limit made sense, then there should have been more than one coal to chemicals facility built in the US in the past 24 years.

With respect to "new or significantly improved" technologies, DOE seeks to specifically exclude technologies solely in the research, development, or demonstration phase. This interpretation appears reasonable, as long as it applies in general to the overall project and does not make a project ineligible just because one subsection of technology is new, such as a new methanol to olefins conversion technology. Arguably, a use of proven or commercial technologies in a new or novel configuration, combination, or implementation method, such as polygeneration, should qualify as a "new or significantly improved" technology. The DOE exclusion of projects with technologies that are in the RD&D phase appears to enable polygeneration, if it "improved the project with respect to energy production, use, efficiency, or transportation."

The law specifically states that an industrial gasification project can receive both an investment tax credit and federal loan guarantee. DOE proposes that receipt of other Federal incentives will be a negative factor in most cases for selection of federal loan guarantee awards. We disagree. Just as DOE argues the potential exception for first-mover nuclear power plants, we argue the same exception for large gasification (particularly as polygeneration) plants, and the law prohibits such a negative consideration in the case of awarded investment or other tax credits.

The DOE program proposal is to guarantee less than 100% of project debt, and at the same time, require that all non-guaranteed debt be subordinated to DOE's position. This proposal appears to undermine program implementation, and thus legislative intention. If this fundamental defect is not addressed administratively, it will, in all likelihood be fixed legislatively.

Finally, Eastman wants to see a successful loan guarantee program. Eastman believes that one of the key elements of a successful program under Title XVII is that loan guarantees are provided

to "creditworthy" projects with experienced practitioners. Creditworthy projects with experienced practitioners will provide the best chance of loan repayment. As DOE has proposed, careful underwriting with attention to revenue certainty and rating agency evaluations will assure this objective. This is a fundamental element of Title XVII (i.e., the "self-pay" concept) and presents the means to avoid cost to the federal government.